

Gavin Gray

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Research Interests

I am interested in how an information processing system can organize itself without global monitoring to perform a learning or inference task. Practically, I am lazy and would prefer it if the different processing stages would arrange themselves with as little input as possible. I'm researching methods to make this happen using transactional or adversarial systems, drawing on probabilistic and game theoretic reasoning.

In practice, I have worked on variational methods to investigate the importance of nodes in a feedforward neural network. In the process, I replicated the paper "[Variational Dropout and the Local Reparameterization Trick](#)". I am working on dealing with the combinatorial evaluation problem in deciding which units are useful to the network for structural decisions in networks.

PhD Neuroinformatics Edinburgh University - 2014 onwards

This project is being supervised by Amos Storkey and D.K. Arvind on the subject of Transactional Filter Graphs. Details of this project can be found on my [profile page for the DTC for Neuroinformatics](#).

Kaggle Competitions 2014 - 2015

Machine learning competitions are hosted regularly by the company Kaggle. I have entered two of these in teams with other Edinburgh students, both times achieving scores in the top 10%. These were [AES Seizure Prediction Challenge](#) and the [National Data Science Bowl](#). On the final leaderboards our team name was Neuroglycerin.

The code written for both competitions is available under an open source license on GitHub: [hail-seizure](#) and [neukrill-net](#). Our seizure prediction was implemented with an array of signal processing techniques combined with a support vector machine classifier. We approached image classification with traditional convolutional neural networks despite trying many alternatives and modifications.

MRes Neuroinformatics Edinburgh University - 2013 to 2014

This programme is designed as a precursor to a three year PhD project at the [Doctoral Training Centre in Neuroinformatics and Computational Neuroscience](#).

Masters Project

This project was a biological data mining project as part of the SynSYS collaboration to investigate synaptic systems of protein interactions. Data mining, parallel processing and machine learning were involved. Full details can be found on the [project GitHub repository](#).

MEng Electrical Engineering and Electronics Edinburgh University - 2008 to 2013

Graduated in 2013 - **First class with honours**.

Also included internship at Broadcom Corporation, more details on request.

Technical Skills

I am experienced working with Python on a variety of projects, including others not mentioned above ([full listing can be found on my GitHub profile](#)). All recent projects have been fully version controlled using Git, using unit testing and continuous integration where possible. I work exclusively in an Arch Linux environment and have learned intermediate system admin in Linux as a result.

Other programming languages I have experience working with include: Matlab, C, HTML, CSS, shell scripting, Latex and Verilog.

References

PhD Supervisor:

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